



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,377	11/03/2003	Shuichi Nakanishi	8017-1106	1120
466	7590	05/18/2005	EXAMINER	
YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202			BLACKMAN, ROCHELLE ANN J	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/698,377

Applicant(s)

NAKANISHI ET AL.

Examiner

Rochelle Blackman

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-17, 20, 21, 26-29, 31, 34 and 35 is/are rejected.  
7) ☒ Claim(s) 18, 19, 22-25, 30, 32 and 33 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 8, 14, 15, 20, 21, 26, 27, 29, 31, 34, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Barak et al. (EP Patent No. 0922986).

Barak discloses a liquid crystal projector (FIGS. 1-7), comprising: an illumination system (10, 12, 22, 24) for alternately emitting a first linearly polarized light beam and a second linearly polarized light beam having directions of polarization that differ by 90 degrees; a liquid crystal display device (30, 32, 34, 40, 42, 44) for modulating light beams from said illumination system; a polarizing filter (also see 12) for filtering a specific polarization component of light beams from said liquid crystal display device; and projection optics (70) for projecting light from said polarizing filter; a polarization beam splitter (12) for receiving said first linearly polarized light beam and said second linearly polarized light beam from said illumination system and splitting said beams in different directions; a first reflective liquid crystal display device (30, 32, 34) for modulating said first linearly polarized light beam that has been split by said polarization beam splitter; a second reflective liquid crystal display device (40, 42, 44) for modulating said second linearly polarized light beam that has been split by said polarization beam

Art Unit: 2851

splitter; wherein said polarization beam splitter combines the light beam that has been modulated by said first reflective liquid crystal display device and the light beam that has been modulated by said second reflective liquid crystal display device (see 12 and see 56 and 68); and said projection optics projects the light beams that have been combined by said polarization beam splitter (see 70); wherein said liquid crystal display device is transmissive or reflective (see 30, 32, 34, 40, 42, 44); wherein said illumination system comprises: a light source (10); an emitted optical path switching means (12) for alternately emitting light beams from said light source in two directions; a first polarization unifying means (for converting light that is emitted in a first direction by said emitted optical path switching means to linearly polarized light (14); a second polarization unifying means for converting light that is emitted in a second direction by said emitted optical path switching means to linearly polarized light (16); and synthesizing optics for combining optical paths of the light from said first polarization unifying means and the light from said second polarization unifying means (also see 12); wherein the direction of polarization of the polarized light that is emitted from said first polarization unifying means and the direction of polarization of the polarized light that is emitted from said second polarization unifying means forms an angle of 90 degrees (see 18 and 20 and col. 5, paragraphs [0031]-[0032]); wherein said synthesizing optics includes a polarized light beam combiner for combining said first linearly polarized light beam and said second linearly polarized light beam (also see 12 and see 56 and 68); wherein said first reflective liquid crystal display device is controlled by left-eye video signals, and said second reflective liquid crystal display device is

Art Unit: 2851

controlled by right-eye video signals (see Fig. 4 and col. 5, paragraph [0034]); a polarization beam splitter (12) for splitting received P-polarized light beam and S-polarized light beam in different directions (although polarization type is not specified, "polarization beam splitter" 12 is considered to split "P-polarized light beam" and "S-polarized light beam" because of the light beams 18 and 20 have different polarities); an illumination means (10, 12, 22, 24) for alternately directing a P-polarized light beam and an S-polarized light beam to said polarization beam splitter; a first reflective liquid crystal display device (30, 32, 34) for modulating a P-polarized light beam that has been split by said polarization beam splitter; a second reflective liquid crystal display device (40, 42, 44) for modulating an S-polarized light beam that has been split by said polarization beam splitter; wherein a direction of oscillation of an electric field of polarized light that is emitted from said first polarization unifying means and a direction of oscillation of an electric field of polarized light that is emitted from said second polarization unifying means form an angle of 90 degrees (see 18 and 20 and col. 5, paragraphs [0031]-[0032]); wherein said synthesizing optics includes a polarized beam combiner for combining a P-polarized light beam and an S-polarized light beam (also see 12 and see 56 and 68); a liquid crystal projector (FIGS. 1-7) for displaying a stereoscopic image (see FIG. 4); said projection optics is a liquid crystal projector that projects the light beams that have been combined by said polarization beam splitter (see 70); wherein: said first reflective liquid crystal display device and said second reflective liquid crystal display device alternately produce a left-eye image and a right-eye image, respectively (see Fig. 4 and col. 5, paragraph [0034]), and said liquid crystal

Art Unit: 2851

projector projects these images (92, 94) onto a screen (90); and the images that are projected onto a screen are viewed through polarization glasses (96) in which a left-eye polarizing element (98) and a right-eye polarizing element (100) have different directions of polarization (see col. 5, paragraph [0035]); wherein the images that are projected on said screen are viewed through shutter glasses (96) wherein a switching of the left- and right-eye images that are projected by said liquid crystal projector is synchronized with left- and right-eye shutters of said shutter glasses (see col. 5, paragraph [0036]).

2. Claims 1, 3, 4, 6, 8, 10, 12, 14, 16, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Takiguchi et al. (JP Patent No. 2002-244211).

Takiguchi discloses a liquid crystal projector (Drawings (1-11), comprising: an illumination system (101-103, 111-113, 121, 171-173, 181-183) for alternately emitting a first linearly polarized light beam and a second linearly polarized light beam having directions of polarization that differ by 90 degrees; a liquid crystal display device (141) for modulating light beams from said illumination system; a polarizing filter (131) for filtering a specific polarization component of light beams from said liquid crystal display device; and projection optics (151) for projecting light from said polarizing filter; wherein said liquid crystal display device is transmissive or reflective (see 141 and paragraph [0022]); wherein said liquid crystal display device is constructed using a ferroelectric liquid crystal material (see 141 and paragraph [0034]); wherein said illumination system comprises: a light-emitting element array (see 101-103) composed of a plurality of light-emitting elements, and a polarization conversion element array (see 111-113); wherein

Art Unit: 2851

said polarization conversion element array receives the light that is generated from a portion of the light-emitting elements of said light-emitting element array and emits said first linearly polarized light beam, and receives the light that is generated from the remaining light-emitting elements of said light-emitting element array and emits said second linearly polarized light beam (see Drawings 9 and 10); wherein said illumination system includes a plurality of combinations of said light-emitting element arrays and said polarization conversion element arrays (see 101-103 and 171-173); wherein one or a plurality of said light-emitting element arrays includes red light-emitting elements, green light-emitting elements, and blue light-emitting elements (see 101-103 and paragraphs [0022] and [0035]); wherein said illumination system comprises: a light source (101-103); an emitted optical path switching means (111-113) for alternately emitting light beams from said light source in two directions; a first polarization unifying means (see 241 of Drawing 9) for converting light that is emitted in a first direction by said emitted optical path switching means to linearly polarized light; a second polarization unifying means (also see 241 of Drawing 9) for converting light that is emitted in a second direction by said emitted optical path switching means to linearly polarized light; and synthesizing optics (see 121) for combining optical paths of the light from said first polarization unifying means and the light from said second polarization unifying means; wherein the direction of polarization of the polarized light that is emitted from said first polarization unifying means and the direction of polarization of the polarized light that is emitted from said second polarization unifying means forms an angle of 90 degrees (see Drawing 9); wherein said light source switches between

Art Unit: 2851

emitting red light, green light, and blue light (see 101-103 and paragraphs [0022] and [0035]); wherein said synthesizing optics includes a polarized light beam combiner for combining said first linearly polarized light beam and said second linearly polarized light beam (see 121).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (U.S. Patent No. 6,536,902).

Lee discloses a liquid crystal projector (Figs. 6-13), comprising: an illumination system (36, 38, 40, 41, 44, 46, 50, 52) for alternately emitting a first linearly polarized light beam and a second linearly polarized light beam having directions of polarization that differ by 90 degrees; a liquid crystal display device (56, 57) for modulating light beams from said illumination system; a polarizing filter (54, 55) for filtering a specific polarization component of light beams from said liquid crystal display device; and projection optics (58) for projecting light from said polarizing filter; a polarization beam splitter (54, 55) for receiving said first linearly polarized light beam and said second linearly polarized light beam from said illumination system and splitting said beams in



Art Unit: 2851

different directions; a first reflective liquid crystal display device (56) for modulating said first linearly polarized light beam that has been split by said polarization beam splitter; a second reflective liquid crystal display device (57) for modulating said second linearly polarized light beam that has been split by said polarization beam splitter; wherein said polarization beam splitter combines the light beam that has been modulated by said first reflective liquid crystal display device and the light beam that has been modulated by said second reflective liquid crystal display device (see 54, 55); and said projection optics projects the light beams that have been combined by said polarization beam splitter (see 58); wherein said liquid crystal display device is transmissive or reflective (see 56, 57); a polarization beam splitter (54, 55) for splitting received P-polarized light beam and S-polarized light beam in different directions; an illumination means for alternately directing a P-polarized light beam and an S-polarized light beam to said polarization beam splitter; a first reflective liquid crystal display device (56) for modulating a P-polarized light beam that has been split by said polarization beam splitter; a second reflective liquid crystal display device (57) for modulating an S-polarized light beam that has been split by said polarization beam splitter.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2851

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 5, 7, 9, 11, 13, 15, 17, 19, 21, 27, 28, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takiguchi et al. (JP Patent No. 2002-244211) in view of Lee (U.S. Patent No. 6,536,902).

Takiguchi discloses the claimed invention except for a second reflective liquid crystal display device for modulating said second linearly polarized light beam that has been split by said polarization beam splitter or a second reflective liquid crystal display device for modulating an S-polarized light beam that has been split by said polarization

Lee teaches providing a second reflective liquid crystal display device (57) for modulating said second linearly polarized light (S-wave) that has been split by a polarization beam splitter (54,55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the Takiguchi reference with a second reflective liquid crystal display device, as taught by Lee in order to modulate a second linearly polarized light to improve color purity and optical efficiency (see col. 3, lines 46-47).

#### ***Allowable Subject Matter***

1. Claims 18, 19, 22-25, 30, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2851

2. The following is a statement of reasons for the indication of allowable subject matter:

Claims 18, 19, and 30 have been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the liquid crystal projector comprising an emitted optical path switching means including the feature, "a moveable mirror" in combination with the particular combination of features recited in claims 1 and 14 or 2 and 15 or 27 and 29.

Claims 22, 23, and 32 have been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the liquid crystal projector comprising synthesizing optics including the feature, "a moveable mirror" in combination with the particular combination of features recited in claims 1 and 14 or 2 and 15 or 27 and 29.

Claims 24, 25, and 33 have been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the liquid crystal projector comprising an illumination system comprising the feature "a single movable serves as both said movable mirror of said emitted optical path switching means and said movable mirror of said synthesizing optics in combination with the particular combination of features recited in claims 1 or 2 or 27.

### ***Response to Arguments***

Applicants' arguments filed March 3, 2005 have been fully considered but they are not persuasive.

Art Unit: 2851

Applicants repeatedly argue, with respect to claims 1, 2, 27, and 34, Barak, Takiguchi, and Lee do not disclose or suggest an illumination system for alternately emitting a first linearly polarized light beam and a second linearly polarized light beam having directions of polarization that differ by 90 degrees and/or illuminating means for alternately directing a P-polarized light beam and an S-polarized light beam to a polarization beamsplitter. Applicants also argue, with respect to claims 20 and 21, Barak does not teach or suggest a polarizer beam combiner for combining the first linearly polarized light and the second linearly polarized light beam.

Examiner disagrees and maintains Barak, Takiguchi, and Lee disclose the claimed structure, illumination system and/or illuminating means, of claims 1, 2, 27, and 34 as elements 10, 12, 22, 24 of the Barak reference, as elements 101-103, 111-113, 121, 171-173, 181-183 of the Takiguchi reference, and as elements 36, 38, 40, 41, 44, 46, 50, 52 of the Lee reference. Examiner also maintains Barak discloses the claimed structure, polarizer beam combiner of claims 20 and 21, as element 12. Further, Barak discloses in col. 3, lines 17-19, element 12 is a polarizing beam splitter/combiner. Claims 1, 2, 20, 21, 27, and 34 do not define structure that patently distinguishes the claims over the applied prior art. **While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (MPEP 2114).**

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

O'Connor et al. (U.S. Patent No. 6,672,722) discloses a projection engine having a first kernel for modulating light of a first polarization, and a second kernel for modulating light of a second polarization, and a polarization combiner for merging light from the kernels into a dual polarization modulated output beam.

Roddy et al. (U.S. Patent No. 6,769,772) discloses a display system (10) for digital color images using six color light sources (12) or two or more multicolor LED arrays (212, 213) or OLEDs (220, 222) to provide an expanded color gamut and uses two or more spatial light modulators (20, 21), which may be cycled between two or more color light sources (12) or LED arrays (212, 213) to provide a six-color display output.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2851

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rochelle Blackman whose telephone number is (571) 272-2113. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RB

  
**JUDY NGUYEN**  
SUPERVISORY PATENT EXAMINER